Appendix A:
Historic Status of Steelhead in Aptos Creek Watershed

The following description of the steelhead fishery is excerpted from Titus, et al, (1994) and reports on conditions throughout the watershed from 1913 to 1985. It reports a decline in the watershed fish population over that period, and indicates excessive sedimentation as a significant cause for that decline.

Aptos Creek Drainage

Snyder (1913) found juvenile steelhead/rainbow trout in Aptos Creek when he sampled there in summer 1909. Juvenile steelhead were present in Aptos Creek during a 1934 CDFG survey. Spawning grounds were found throughout the stream, natural propagation was rated as very good, and fishing pressure for steelhead was heavy. When surveyed again by the CDFG in May 1941, the condition of the stream was apparently similar as in 1934, although both young-of-the-year and older steelhead occurred in low abundance in the stream, and none was seen in the lagoon.

Aptos Creek was not surveyed again by the CDFG until July 1960. At that time, high quality spawning and rearing habitats were still available, and no migration barriers or diversions were seen. Densities of juvenile steelhead in non-pool habitats ranged from about 5–10 trout/30 m in the upper survey area to 40–65 trout/30 m in the lower stream. In pools, densities ranged from about 10–20 trout/pool. Siltation below Bridge Creek was believed to have reduced the steelhead production capacity of the stream somewhat through loss of cover for rearing fish. Fishing pressure was noted as light.

In a summer 1965 CDFG survey, it was estimated that nearly 9 km of the stream contained intermittent reaches of spawning gravels, 13 km contained high quality rearing habitat, and there were no barriers or diversions. The average density of juvenile steelhead over the entire stream was about 3.3 trout/m, except for a 0.8 km reach which contained 4.6 trout/m. The estimated total abundance of young steelhead was over 43,000 trout. All steelhead observed were young-of-the-year; natural propagation was rated as good. Fishing pressure was noted as moderate.

The adult steelhead run in Aptos Creek as of 1968 was estimated by the CDFG at about 1,500 fish, although the method used to attain this estimate was not described. In April 1976, the CDFG supplemented the Aptos Creek steelhead population with 1,000 juveniles from the Noyo River.

The creek was surveyed by the CDFG in late May 1982, from the mouth to 2.4 km above the confluence with Bridge Creek, following the disastrous rainstorms of January 1982 (L. Turner, CDFG, unpubl. memo. of 1 June 1982). Siltation, as a result of landslides, had degraded both spawning and rearing habitat. In addition to landslides, logjams created full or partial barriers to fish migration. Fish food organisms were scarce, and no juvenile steelhead were observed. Apparently, the pre-smolts present the previous fall were killed or displaced by the high flow, or emigrated to the ocean. In addition, the entire 1982 year-class was apparently eliminated by siltation of the gravels where eggs were incubating.

CDFG surveys of Aptos Creek were conducted during 12–26 August 1985 (D. Marston, CDFG, unpubl. memo. of 12, 20, & 26 August 1985). The stream was surveyed over nearly 9 km, from the mouth to the area known as the bottom of the incline, within the Nisene Marks State Park boundary. Within the lowermost 2.4 km, there remained a logjam from the 1982 flood which created at least a partial barrier to upstream migration of adult steelhead. Suitable spawning areas were lacking below the barrier, but as one progressed upstream through the survey area, substrate particle size increased on average and the overall abundance of suitable spawning gravel increased. Pools and shelter for rearing juveniles were present

throughout the survey area. Yearling steelhead were abundant below the barrier in the lower stream, but few young-of-the-year were present there. Trout were also present above the barrier, and their abundance generally increased toward the upstream area. Their lengths ranged from about 2.5 to 20 cm. Some of these fish were believed to be resident rainbow trout. In the uppermost 2.8 km of the survey area, both young-of-the-year and yearling steelhead/rainbow trout were abundant. A state park ranger had seen an adult steelhead in this area.

Bridge Creek The Aptos Creek tributary, Bridge Creek, was surveyed by the CDFG in July 1960. Spawning areas were fair to good in the middle and lower stream, but very poor above an impassable waterfall barrier, about 2.5 km upstream from the confluence with Aptos Creek. Rearing habitat was adequate, especially in the middle and lower stream. Juvenile steelhead, 5–15 cm long, were common throughout the middle and lower stream, but absent above the waterfall.

Bridge Creek was not surveyed again until May 1982, following the devastating storms of January 1982 (L. Turner, CDFG, unpubl. memo. of 2 June 1982). Landslides, logjams, and falls rendered the stream unusable for steelhead. Besides restricted access due to barriers, the stream bottom was composed primarily of rubble and silt. No fish were observed in the creek at that time, although juvenile steelhead/rainbow trout were reportedly present in Bridge Creek in 1985 up to Maple Falls (D. Marston, CDFG, unpubl. memo. of 26 August 1985).

Valencia Creek In late fall 1981, the mean ± SD density of smolt-sized steelhead at two sites in Valencia Creek, was 4.9 ± 0.9 trout/m, which was above the county-wide average (derived from Smith 1982b).

Appendix B:
Technical Memorandum, Aptos Creek Watershed Assessment and Enhancement Plan: Salmonid Habitat and Limiting Factors Assessment (Hagar, 2002)

Appendix C:
History of Forest Resource Extraction

Excerpted from Forest of Nisene Marks State Park General Plan, CDPR, 2003, pp. 34-41

The Boom in the Mid-1860s

The Aptos Landing wharf was the key to any successful operations on the Aptos Rancho and when Titus Hale rebuilt and extended Castro's original wharf in 1866, it set off a small lumber and firewood boom. Hale and his business partners were interested primarily in the oak trees that dotted the hills behind Castro's house, so they signed a ten year lease allowing them to cut any trees on the entire rancho except fir or redwood. By late 1867 over 4,000 cords of oak firewood were awaiting shipment off the wharf, and San Francisco newspapers claimed that Aptos oak firewood was the best wood available on the San Francisco market. Much of the original oak woodland in and around Aptos went to the hearths of San Franciscans. The pine and redwood was reserved for Benjamin, Uriah and Merritt Nichols who built a water-powered mill along Aptos Creek in 1866 near the northern boundary of the rancho. They selected a place where the stream passed through a narrow gorge (immediately beneath the present-day steel bridge), and built a system of flumes and millraces that powered saws able to cut 4,000 board feet of lumber a day. They dammed the creek at the narrow spot and used the resulting lake as a millpond. Except for seasonal closures, the mill operated steadily from 1867 to 1878.14 A small town known as Aptos grew up at the intersection of the always-problematical county road and the road to the wharf at the landing. But, the difficulty of access continued to retard the development of the huge treasure-store that was the upper Aptos Canyon.

The Soquel Augmentation – Above the Line – to 1882

While Rafael Castro and Claus Spreckels worked at bringing agriculture and industry to the lower Aptos Canyon, the upper Aptos Canyon remained relatively quiet. A few split stuff operators nibbled at the smaller redwoods in the more accessible reaches of the land, carrying their product westward to the Soquel drainage on horses and mules. But, for the most part, the canyon was filled with potential. Without the usual upstream mills and tanneries that plagued other local streams, the upper Aptos was a legendary trout fishing stream during the 1860s and 1870s. In 1865, a newspaper account of the fishing on Aptos Creek: *On Thursday last, two well known citizens of Santa Cruz, in company with a gentleman from San Francisco caught eleven dozen fine large speckled trout— some of them a foot in length. One of the party, an expert, took seven dozen, which we think is pretty good fishing and hard to beat…"* An 1866 article ranked the county's trout streams listing the San Vicente Creek number one and Aptos Creek number two. It described Aptos Creek as a "*very fine trout stream."* All of this was about to change. In 1865, County Surveyor Thomas Wright wrote of Carmel Fallon's Soquel Augmentation tract: "*It is estimated that over two hundred million feet of red wood lumber can be cut off this land, besides, shingles, shakes, staves, fence pickets, posts, railroad ties, etc. Large quantities of tan-bark oak grows in great luxuriance, and no estimate can be made of the amount of tan-bark, cord-wood, hoop-poles,etc. to be found on the thousand hills embraced within the tract."* 18 The Fallon's interests were elsewhere, however, and though Tom Fallon attempted several smaller development schemes along the ocean front bluffs near Soquel, the upper Aptos Canyon remained locked in by technological and financial barriers. The rugged canyon had no easy access, and the huge redwoods were much too large for the small, water-powered mills such as that being operated by the Nichols to the south. Meanwhile, the Fallon marriage was not going well. There had always been rumors of Thomas Fallon's alcohol-driven abuse of his family, so Carmel's divorce suit in 1876 was no surprise. The suit resulted in a divorce settlement that saw Carmel receive clear title to the 6,845-acre parcel that included the upper Aptos Creek watershed. By the early 1880s, Carmel Fallon needed some cash, and word circulated throughout Santa Cruz County that the treasure-laden upper Aptos watershed was for sale.

The Southern Pacific Era: Big Lumber Comes to Aptos – 1880-1883
The financial and technological forces necessary to open the treasures of the Aptos Canyon began to coalesce in 1880 with the arrival of the Southern Pacific Railroad on the Monterey Peninsula. During a six-month frenzy the state's most powerful corporation purchased the undeveloped forest lands behind Monterey (today's Del Monte Forest), built the world-class Hotel Del Monte, and laid a broad gauge spur line from Castroville to Monterey. Chinese laborers provided most of the labor in these projects. In 1881 the corporation quickly snapped up the bankrupt Santa Cruz Rail Road, repaired it and put the narrow gauge back into the operation. The corporation had plans that were larger than the tiny 36 inch gauge track could handle, however, and in 1883, a crew of Chinese railroad workers strengthened the trestles, pulled up the old rail and laid heavier standard gauge tracks. The economic doldrums of the 1870s had receded in the face of a statewide economic boom lead by Southern California. Soledad marked the southernmost end of the Southern Pacific's coastal railroad route, and beyond it beckoned the huge Los Angeles lumber market. Not to mention the hundreds of thousands of redwood railroad ties that would be required to extend the coastal railroad to Los Angeles. The Southern Pacific needed a new source of redwood lumber close to the Monterey Peninsula and Southern California.

The Watsonville Lumber and Milling Company
Meanwhile, a coalition of Santa Cruz County lumbermen also recognized the growing market for redwood lumber, and in 1881 they formed the Watsonville Lumber and Milling Company. Led by long-time Pajaro Valley farmer and developer John T. Porter, the company's board of directors was a who's who of local financial leaders, including Lucius Sanborn and Charles Ford. We don't know exactly who invited the Southern Pacific interests into the Watsonville Lumber and Milling Company meetings, but out of the cigar smoke in 1883 there emerged two entities: the Loma Prieta Lumber Company to cut and mill the lumber, and the Loma Prieta Railroad to build a spur railroad line up into the Aptos Canyon to move the huge logs to the mill and carry the finished lumber down to Aptos. And it was all fueled by Southern Pacific Railroad capital.

The Loma Prieta Lumber Company – Phase #1 1883-1900
Only the Southern Pacific Railroad had the financial and technological muscle to open up the redwood treasure chest in the Aptos Canyon. To say that what they achieved was remarkable is to understate the story. Hundreds of Chinese laborers were brought in and literally overnight they cut and graded the railroad line three miles into the canyon. From that point northward, the grade required bigger cuts, higher fills and more trestles per mile. Eventually, by 1890 the Chinese workers had laid seven and a half miles of standard gauge track and built eleven trestles. This was no delicate narrow gauge operation with tight curves and steep grades; this was an audacious, arrogant, broad-shouldered assault on some of the most convoluted and complicated landscape in all of California. They didn't go around ridges, they went through them; they didn't follow the twists and turns of Aptos Creek, they straightened it out with trestles. And each winter Nature took back what she had so reluctantly surrendered the previous spring. Winter freshets tore out the line and landslides twisted the track so that each spring long sections of the railroad had to be rebuilt. In some places at the upper end of the rail line the railroad grades cut into the canyon walls have completely disappeared, and the only clues remaining of the incredible human effort are twisted pieces of railroad rail in the bottom of the creek. The per-mile cost of building this railroad was estimated to be in excess of $100,000.

The Town of Loma Prieta
In all the other logging operations in the Santa Cruz Mountains, temporary clusters of makeshift single-wall cabins clustered around the sawmills. These logging camps were common throughout the mountains. The Loma Prieta operation resulted in a bonafide town with store, saloon, school, and church. Babies were born in Loma Prieta, and you could send and receive mail, a telegram, or freight. Since the town was an official destination on the Southern Pacific line, you could purchase a ticket in Chicago that would list Loma Prieta, California, as your final destination. During the summers the town boasted a population of

over 300 people living and working in over sixty buildings. The Loma Prieta Mill The lumber mill located just downstream from the townsite was the largest 19th century lumber mill in the Santa Cruz Mountains, capable of turning out 70,000 board feet of lumber during a regular twelve hour day, ten times that of its Nichols Brother's predecessor downstream. In the summer of 1888, during a contest with a neighboring sawmill on Valenica Creek the Loma Prieta Mill cut 181,000 board feet of lumber in a 6-½ hour run. A three hundred foot cribbed log dam was built across Aptos Creek just upstream of the mill and the huge logs were rolled into the pond and maneuvered in position to be drawn into the mill. The cut lumber was stacked on the flat just downstream from the mill, and from there shipped by rail down to Aptos. A second smaller mill, named Monte Vista, was built one and a half miles above the town site, and it cut logs that were being brought down the steep-sided Aptos Canyon. In 1888 the Monte Vista Mill was moved to its final location seven miles above Aptos in the Aptos Canyon where it operated until all the good timber in the canyon was cut in 1899. Cutting the Aptos Canyon The fallers began at the creek bed and then worked their way up the steep-sided canyons, cutting all of the larger, good grade redwood (known as saw logs) and Douglas fir trees. Smaller trees and those with large imperfections were skipped, and today the second-growth redwood forest on the canyon walls is punctuated here and there by gnarled old growth trees that survived the onslaught. The saw logs were peeled, cut into sections, and then maneuvered into ravines and gullies where they were chained together and dragged down to Aptos Creek by teams of oxen. If the mill was close by and downhill, the logs were skidded directly there, but if necessary, they were loaded aboard flatcars and taken to the mill by rail. Gravity was the logger's greatest ally. And much like the water that formed the gullies and ravines that etched the canyon walls, the logs were pulled down the watercourses to the railroad at creek level. All of this cutting, skidding and hauling had a colossal impact on the land. Side canyon gullies were scraped clear, and the dirt, rocks and other debris rolled into the streams and were then carried down to the main stem of Aptos Creek. Sawdust from the mills was thrown directly into the creek, and in the winter, the thick dust that covered every part of the logging operation washed into the creek. There are no glowing accounts of fishing on Aptos Creek published in the local newspapers after 1883, and in those 1890s accounts that listed the county's premier trout streams, Aptos Creek is never mentioned.

Logger's fires

Fire was a tool used regularly by the loggers. The fallers worked in the woods during the winter months when the mills and ox teams were idled by the mud and bad weather. The logs were peeled, and the bark allowed to dry out sufficiently during early spring so that in April and May the bark, slash, and assorted detritus created by falling and bucking the logs could be cleared from the forest floor by burning. Then, once the clutter was removed, the landscape was clear for the work of dragging the logs down to Aptos Creek. This burning was carried out in late spring before the surrounding, unlogged forest dried out. The loggers did not intend to set the entire forest ablaze, and rarely did.

Split Stuff and Tanbark

Once the main logging operation was finished in an area, independent contractors who specialized in making split products (pickets, posts, ties) entered the ravines and cut down some of the trees left behind by those cutting saw logs. Tanbark crews also moved into the forest and during the winter and spring, when the moisture content in the tanbark oaks was high and the bark peeled off easily, they cut the trees down and peeled off the bark in fourfoot lengths. These rolls of tanbark were then hauled out by mules and sold to local tanneries. Also, other specialists like hoop pole contractors entered the woods and cut the long, slender, pliable hazelnut trees and sold them to coopers who used them to make barrel hoops. The depression of the mid-1890s slowed the Loma Prieta's lumber operation in the Aptos Canyon, but it was the winter of 1898-1899 that finally brought this huge logging operation to a close. There was not enough standing timber to justify rebuilding the mill, and the company removed the mill at Monte Vista and moved the Loma Prieta Mill around and rebuilt it in the lower part of their property in Hinckley Basin.

The Last Loma Prieta Lumber Company Campaign – Bridge Creek – 1917-1922

The lessons of the Molino Timber Company were not lost on the directors of the Loma Prieta Lumber Company. So, after a lengthy negotiation with the heirs of Frederick August Hihn, the company purchased the west side of Bridge Creek and its estimated 15,000,000 board feet of redwood. Included in this tract was a cluster of huge redwoods, one of which was measured at eighteen feet in diameter. The company then purchased all the Molino Timber Company's rolling stock, and extended their broad gauge line with a narrow gauge up Bridge Creek. However, because they were milling the huge logs at their old Loma Prieta mill, an incline would not be feasible to reach the huge trees halfway up the ridge. Instead they put in a switch back, and the tiny locomotive, clanked laboriously up and around the ridge, eventually turning what had been called Big Tree Gulch into Big Stump Gulch. Finally, in 1922, the four-decade assault on the landscape was over. The Loma Prieta Lumber Company began selling off its equipment and removing its tracks, and the land began the slow process of healing. Already, in the lands cut in the 1880s, the green fringe of redwood sprouts were growing quickly upward, creating a second-growth forest, the forerunner of what we see in the canyons today.

Appendix D:
Excerpts from Geomorphology & Sediment Source Assessment Technical Memorandum, by Swanson Hydrology and Geomorphology, 2003